Managing the global commons: The economics of climate change

William D. Nordhaus (Yale University)

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Coping with the challenges of global warming is a daunting task for both scientists and economists, who must understand future changes, and for policy makers, who must ultimately choose policies to balance risks and costs. *Managing the Global Commons* presents a unique effort to encompass economic, scientific, and policy aspects of this great geophysical experiment.

Managing the Global Commons provides a detailed analysis of the DICE model (Dynamic Integrated model of Climate and the Economy) as well as an extensive analysis of the model's results. DICE is the first dynamic model to include a closed-loop system that includes emissions, concentrations, climate change, damages, and emissions controls. The model is useful for estimating the costs and benefits of different paths for slowing climate change and for analyzing the impact of control strategies over time.

The analysis contains a number of methodological advances and major findings—most importantly the construction of a small model to encompass the primary components of the climate and economic system within an optimization framework. Also included are new techniques and results concerning the role of uncertainty and the "risk premium" involved in policies to slow global warming. In addition, the analysis derives a set of uncertain representative scenarios that summarize the large number of potential outcomes into a manageable number to be used within an optimization framework and incorporated into a contingent-commodity framework.

Nordhaus examines several different approaches to climate-change policy: no controls, economic optimization, geoengineering, stabilization of emissions and climate, and a ten-year delay in undertaking climate-change policies. Among these, there is a modest advantage of an efficient policy over no controls or a ten-year delay, while the three stabilization options would impose significant net costs. Overall, Nordhaus observes, the analysis reveals that even with major technological breakthroughs and stringent controls, the momentum of past greenhouse gas emissions coupled with great inertia in climate change policy will lead to an inevitable rendezvous with massive climate change.